Space Weather Forecast

Issued on Friday, 27 October 2023 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Fast solar wind influence bringing a chance G1/Minor Storm intervals initially, and likely G1-G2/Minor to Moderate Storms into day 4 (30 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with occasional common flare activity and a peak moderate flare at 26/2324 UTC from the region in the northeast. There are four sunspot regions on the disc. Two numbered in the southwest disc, which are both small, although one has shown development of weak intermediate spots. A further small unnumbered spot between them has now fading. The newly numbered region in the northwest is a small region, however further development is possible. A further small region closer to the limb is now numbered, with ongoing development also possible.

No Earth-directed CMEs (coronal mass ejections) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind showed a likely connection to a fast wind. Solar wind speeds steadily increased from background, around 330km/s, to become elevated around 500 km/s. The interplanetary Magnetic Field (IMF), Bt, was initially weak but increased in a step-wise fashion through the first half of the period, becoming persistently Moderate. The north-south component, Bz, was highly variable, with a similar increasing trend in magnitude. Geomagnetic activity was Quiet to Active (Kp 1-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity forecast with occasional common class flares, and a slight chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are no Earth directed CMEs expected. Current fast solar wind enhancement is expected to see a reduction in speeds during the next 24hrs, though a enhanced risk of geomagnetic activity persists to start the forecast period. A return to more benign conditions then expected into day 2 (28 Oct). The next enhancement is then expected to be from the large coronal holes both approaching centre disk, with the fast solar wind associated with these expected either later on day 3 (29 Oct) or early day 4 (30 Oct). Unsettled to Active geomagnetic activity is expected into day 1 (27 Oct) with a chance of G1 Minor Storms intervals. Conditions expected to ease to mainly Quiet with a chance of Unsettled spells into day 2 (27 Oct). G1/Minor storms are increasingly likely through day 3 into day 4 (29-30 Oct) with the expected onset of fast solar winds.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	10	30	60
Strong	G3	No	1	1	5	10
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	10	10	15	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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